

- 1 1. Apparatus for aerial rearmament of aircraft, comprising:
2 a boom, said boom being attachable to and extendible from a rearming
3 aircraft;
4 a weapons mount, said weapons mount being attachable to an aircraft
5 which is to be rearmed;
6 said weapons mount being capable of accepting a munition; and
7 a weapons platform, said weapons platform being attached to said boom,
8 said weapons platform being capable of positioning and orienting
9 said munition for transfer from said boom to said weapons mount.
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- 1 2. Apparatus as in claim 1, further comprising:
2 means for providing aerodynamic lift to said boom.
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- 1 3. Apparatus as in claim 2, further comprising:
2 a first sensor mounted on said weapons platform; and
3 a second sensor mounted on said weapons mount;
4 wherein said first sensor cooperates with said second sensor so as
5 to assist in guiding said weapons platform to said weapons mount.
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- 1 4. Weapons mount as in claim 1, further comprising:
2 a plurality of hooks for engaging loops on said munition;
3 means for simultaneously forcing open said hooks so as to disengage said
4 plurality of hooks from said loops and release said munition; and
5 a plunger for forcing said munition downward and away from said
6 weapons mount immediately upon release.
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- 1 5. Weapons platform as in claim 1, further comprising:
2 a movable cradle to provide said positioning and said orienting of said
3 munition; and
4 a plurality of calipers for holding said munition to said movable cradle.

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1 6. Apparatus of claim 3, further comprising:

- 2 a computer and monitor;
- 3 a CCTV camera and television monitor;
- 4 a guidance unit;
- 5 an electrical power source
- 6 a hydraulic pump; and
- 7 a plurality of hydraulic control valves,

8 wherein:

9 said computer receives and processes data generated by said first sensor and said
10 second sensor;
11 said computer further generates and forwards instructions from said processed
12 data to said guidance unit;
13 said guidance unit actuates said plurality of hydraulic control valves so as to cause
14 hydraulic pressure from said hydraulic pump to effectuate positioning of
15 said boom; and
16 said CCTV camera captures an image of said positioning and said orienting of
17 said munition being transferred from said boom to said weapons mount
18 and displays said captured image on said television monitor.

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1 7. Apparatus of claim 6, further comprising:

- 2 a first interactive computer program, comprising:
 - 3 means for selecting combinations of said rearming aircraft, said
 - 4 aircraft to be rearmed, and said munitions;
 - 5 means for storing and accessing said selected combinations in a
 - 6 database;
 - 7 means for determining the quantity, availability, and compatibility
 - 8 of said rearming aircraft, said aircraft to be rearmed and said
 - 9 munitions; and
 - 10 means for displaying said means for selecting, said means for
 - 11 storing and accessing, and said means for determining.

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1 8. Apparatus of claim 7, wherein said first interactive computer program cooperates
2 with a centralized database.

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1 9. Apparatus of claim 8, wherein said centralized database is selected from the
2 group consisting of: an Air Tasking Order (ATO) and a Theater Battle
3 Management Core System (TBMCS).

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1 10. Apparatus of claim 8, wherein said first interactive computer program cooperates
2 with said centralized database in real-time.

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1 11. Apparatus of claim 6, further comprising:
2 a second interactive computer program, comprising
3 means for guiding the transfer of said munition from said rearming
4 aircraft to said aircraft to be rearmed;
5 means for determining and indicating the spatial orientation of said
6 munition during said transfer; and
7 means for determining and indicating the status of said transferred
8 munition.

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1 12. Means for guiding as in claim 11, further comprising:
2 means for displaying the relative orientation of said first sensor to said
3 second sensor; and
4 means for operator to correctly position said boom based on said displayed
5 relative orientation.

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1 13. Means for determining and indicating the spatial orientation of said munition as in
2 claim 11, further comprising:

3 means for determining and indicating the azimuth angle, elevation angle
4 and yaw angle of said weapons platform; and

5 means for determining and indicating the distance between said weapons
6 platform to said weapons mount.

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1 14. Means for determining and indicating the status of said transferred munition as in
2 claim 11, further comprising:

3 means for determining and indicating whether or not said munition is
4 “docked”;

5 means for determining and indicating whether or not said munition is
6 “hooked”; and

7 means for determining and indicating whether or not said munition is
8 “armed”.

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1 15. Apparatus as in claim 11, wherein said means for guiding the transfer, said means
2 for indicating the spatial orientation, and said means for indicating the status
3 further comprise an interactive computer display for viewing the same by an
4 operator.

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1 16. Means for the direct release of a munition from a rearming aircraft, comprising:
2 a boom, said boom being attachable to and extendible from said rearming
3 aircraft;
4 a conveyor attached to said boom, wherein said conveyor conveys said
5 munition from said rearming aircraft to end of said boom;
6 means for providing aerodynamic lift to said boom; and
7 a plurality of calipers for holding said munition to said conveyor, until
8 said calipers are commanded to release said munition.

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1 17. Method for aerial rearmament of aircraft, comprising the steps of:
2 extending a boom from a rearming aircraft;
3 affixing a munition to said boom;

4 providing aerodynamic lift and aerodynamic directional control to said
5 boom so as to support and maneuver said boom with said affixed
6 munition;
7 adapting an aircraft which is to be rearmed so as to receive said munition
8 from said boom;
9 positioning and orienting said munition for transfer from said boom to said
10 adapter of said aircraft to be rearmed; and
11 captively engaging said munition onto said adapter.
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1 18. Method of claim 17, further comprising the steps of:
2 a first step of sensing the position of said boom;
3 a second step of sensing the position of said adapter; and
4 cooperating between said first step of sensing and said second step of
5 sensing; and so as to guide said boom to said adapter.
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1 19. Method of claim 18, further comprising the steps of:
2 processing data generated by said first step of sensing and said second step
3 of sensing;
4 generating and forwarding instructions from said step of processing data to
5 a guidance unit;
6 actuating a plurality of control mechanisms so as to effectuate positioning
7 of said boom;
8 capturing an image of said positioning and said orienting of said munition;
9 and
10 displaying said image on a means for viewing by an operator.
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1 20. Method of claim 17, further comprising the steps of:
2 selecting combinations of said rearming aircraft, said aircraft to be
3 rearmed, and said munitions;
4 storing and accessing said selected combinations in a database;

5 determining the quantity, availability, and compatibility of said rearming
6 aircraft, said aircraft to be rearmed and said munitions; and
7 displaying said selected combinations.

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1 21. Method of claim 20, further comprising the step of cooperating with a centralized
2 database.

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1 22. Method as in claim 18, further comprising the steps of:
2 determining and indicating the azimuth angle, elevation angle and yaw
3 angle of said boom; and
4 determining and indicating the distance between said munition on said
5 boom to said adapter on said aircraft to be rearmed.

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1 23. Method as in claim 18, further comprising the steps of:
2 determining and indicating whether or not said munition is “docked”;
3 determining and indicating whether or not said munition is “hooked”; and
4 determining and indicating whether or not said munition is “armed”.

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